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# Size of countries and performance of multinational subsidiaries

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# SIZE OF COUNTRIES AND PERFORMANCE OF MULTINATIONAL SUBSIDIARIES

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## Biographic Note

Ana Isabel Costa Marques was born in Matosinhos on April 14th, 1993. She graduated in Economics at the University of Aveiro in 2013 and entered the Master in Economics, at Faculdade de Economia da Universidade do Porto, in 2015.

During her academic years, she has participated in several student associations since her second year of college and was part of the Erasmus Programme in Italy (2014/2015).

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## Abstract

Although there is an extensive literature on the determinants of firms' performance, few studies have focused on the role of country size. Therefore, this dissertation has the purpose of filling a gap in the literature that deals with the analysis of subsidiary performance and its relationship with country size. Moreover, this dissertation focuses on European countries with the aim of making a comparison, in terms of subsidiary performance, between large and small countries in order to ascertain if there are significant performance differences and whether these differences differ across different performance measures (ROA, ROE, ROS and Assets Growth) and across different country measures (Population, GDP and GDP per Capita).

Based on a sample of 16,661 subsidiaries, from 26 countries and resorting to the non-parametric Mann Whitney test, we concluded that subsidiaries located in larger countries, have, on average, better performance than subsidiaries located in smaller countries. These results are robust regardless the performance measured used.

**JEL Classification:** F43, L25

**Keywords:** Country Size, Multinational Enterprises, Subsidiaries, Performance, Profitability.

## Resumo

Embora exista uma extensiva literatura no que diz respeito aos determinantes da performance de empresas, poucos estudos se têm focado no papel do tamanho do país a este respeito. Desta forma, esta dissertação tem como objetivo preencher a lacuna existente em relação à análise da performance de subsidiárias e a sua relação com o tamanho do país. Para além disto, esta dissertação irá focar a análise em países Europeus. O objetivo será o de comparar, em termos de performance, as subsidiarias localizadas em países de grande e pequena dimensão de modo a verificar se existem diferenças significativas de performance e se estas diferenças variam consoante a medida de performance usada (ROA, ROE, ROS e crescimento de ativos) e diferentes medidas de dimensão do país (População, PIB e PIB per Capita).

Baseando-nos numa amostra de 16,661 subsidiárias de 26 países e recorrendo ao teste não paramétrico Mann Whitney, concluímos que as subsidiárias localizadas em países de grande dimensão, têm, em média uma melhor performance em relação às subsidiárias localizadas em países de pequena dimensão. Estes resultados mantêm-se independentemente das medidas de performance utilizadas.



**Código JEL:** F43, L25

**Palavras-Chave:** Dimensão do País, Empresas Multinacionais, Subsidiárias, Performance, Lucro.

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FSA: Firm Specific Advantages

MNE: Multinational Enterprise

NACE: Statistical Classification of Economic Activities in the European Community

OECD: Organization for Economic Co-operation and Development

R&D: Research & Development

UNCTAD: United Nations Conference on Trade and Development

# 1. Introduction

Globalization is not a new phenomenon and if at the end of the 20th century there were developments occurring in the world that made countries more independent (e.g. the disintegration of some countries like the Soviet Union), it also made countries to depend more on each other in order to prosper. This has boosted companies to find new ways to seek improvements and succeed in the global competition.

Multinational Enterprises (MNEs) are an active actor on the competitive environment because of their ability to influence the globalization process by speeding the diffusion of management practices and technology between their subsidiaries (McCann and Acs, 2011).

At the end of 1997, there were nearly 54 thousand multinationals enterprises controlling about 450 thousand affiliates in the world (UNCTAD, 1998), and if we compare this number to the one in 2016 we can see that such number increased significantly. In 2016 there were about 100 thousand multinationals enterprises with about 900 thousand foreign subsidiaries (UNCTAD, 2017).

The increasing number of MNEs and foreign subsidiaries through the years shows the growing importance that multinationals have to the world´s economy. Multinational enterprises have an important relation with foreign direct investment insofar as they are primarily responsible for such investment. According to Chung and Beamish (2006), MNEs maximize their returns by integrating their activities across countries, taking advantage of the multi-country networks. In this way, they are able to capture economies of scope and scale.

Multinational firms are key actors for the development of an economy. It is widely recognized that multinational corporations, through their foreign subsidiaries, generate several effects in the host country. As such, the impact of multinational firms' activities on host countries depends partially on the performance of the MNEs' affiliates located on those countries.

As stated by authors like Chung and Beamish (2006) and Hansen and Gwozdz (2013), in International Business Theory we find many studies in regard to foreign direct investment and the way to make it profitable. Also, we find many studies where the performance of the parent firm (headquarter) is taken into account. However, we only can find few studies where

the subsidiary performance and its determinants are included. In the same direction, for Chan, Isobe and Makino (2008) the majority of studies that focused on firm performance have not provided many insights on the performance differences among subsidiaries in host countries.

Although there is an extensive literature on the determinants of firm´s performance, few studies have focused on the role of country size. At the best of our knowledge and despite the existence of several articles regarding country size and growth (e.g. Alesina and Spolaore, 1997), trade (e.g. Alouini, 2009; Badinger, 2008) and internationalization (Garcia-Fuentes, Kennedy, and Ferreira, 2016), only Christmann, Day and Yip (1999) provide insights regarding how subsidiary's performance varies among host countries. In this way, the present work comes with the purpose of filling a gap in the literature that deals with the analysis of subsidiaries performance and its relationship with country size.

The key research questions to be answered in this work are:

- Are there differences on the performance of MNEs subsidiaries between large and small countries?
- Do these differences differ according to the performance measures or country size measures?

These questions will be studied using a non-parametric method and a sample of 16,497 subsidiaries from 26 countries for the period of 5 years (2010-2015). The pertinence of this dissertation, in addition to the relevance of the topic, is justified by the lack of quantitative work on this matter.

This dissertation will include the following five chapters. The first chapter includes a literature review on the key concepts such as, multinational enterprises, country size and performance of MNEs' subsidiaries as well as the relevant concepts for the theme. Secondly, the methodology will be described, including the research hypotheses, description of variables, sample used and a summary of the descriptive analysis. The empirical results will be presented in chapter four where the non-parametric test will be conducted. Finally, there will be a chapter with the conclusions, limitations and further research avenues.

# 2. Literature Review

The purpose of this chapter is to highlight the key concepts that are behind the present work. In the first section (2.1.) the main definition of Multinational Enterprises and its subsidiaries will be presented, as well as the different scopes for country size. Also a brief summary of the different dimensions of performance measurement is defined. Section 2.2. will focus on the determinants of a subsidiary performance and finally, the last section (2.3.) will present a synthesis of empirical studies regarding subsidiary performance determinants.

## 2.1. Key Concepts

### 2.1.1. Multinational Enterprises and foreign subsidiaries

Multinational Enterprises (MNEs) or transnational corporations are by definition "enterprises that control and manage production establishments located in at least two countries" (Caves, 1996, p.1). This definition is widely accepted by the different academic institutions, database collectors such as the United Nations Conference on Trade and Development (UNCTAD) and most national governments. UNCTAD considers transnational corporations, enterprises on which are included both parent firms and their foreign subsidiaries. While the parent firm is the one that controls assets of other organizations in a country other than its home country, the foreign affiliate can be divided into subsidiary enterprises, associate enterprises and branches (UNCTAD, 2007; UNCTAD, 2009).

According to the UNCTAD (2009), a subsidiary is established in the host country in which another entity owns more than half of the shareholder's voting power. Many of these are wholly-owned subsidiaries (the foreign investor owns 100% of the voting power). An associate is an enterprise in which the foreign investor holds between 10 and 50% of the voting shares (it has less than the majority ownership), and branches "are unincorporated entities covering businesses that are not incorporated in the country where they are domiciled, such as general partnerships and limited partnerships" (UNCTAD, 2009, p. 50-51).

What distinguishes a multinational enterprise from a regular company is the high level of coordination in the hierarchy of business decisions that the MNE has (Habib and Victor, 1991). According to Bhatti, Larimo and Coudounaris (2015) the process of internationalization of a MNE is made through the establishment of networks of foreign subsidiaries instead of exporting. This is not an easy process. Indeed, becoming a Multinational Enterprise requires that the affiliate becomes able to accomplish certain connections and develop some level of knowledge and ownership in a way that the process of performance does not fail (Rugman, Nguyen and Wei, 2016).

### 2.1.2. Country Size

An important challenge regarding the present work is the definition of country size as it can be measured by different criteria. Country size can be measured by four dimensions: demography, economic power, territory and political size; due to the fact that it can be measured in different ways, it makes this definition so complex (Alouini, 2009).

Demographically, if we focus on the European Union countries and taking population as measure for country size, we can see that the largest country, Germany, has 81 million inhabitants, while the smallest country, Malta, has 430 thousand inhabitants (PORDATA, 2017). If we take economic power as a measure for country size (usually based on GDP), it could diverge from 3 trillion euros (Germany) to only 8 billion for Malta (World Bank, 2017). If we now think about population density as the measurement of a country´s territory, Malta overpasses Germany with 1361 inhabitant per km2 and the most inhabited country of Europe, Finland, only has 16 inhabitants for km2 (PORDATA, 2017). Regarding political as measured by the ratio of government expenditure to GDP, Finland is now the largest country in the Europe (OECD, 2017).

Opening our research worldwide, Germany, the biggest country in the European Union in terms of population, becomes just a medium country in this context. In fact, only the European Union taking into account as a whole can be considered as big in the world economy (Alouini, 2009).

Regarding the method to divide countries in terms of country size, there are different criteria depending on each author. In the European Union, Alouini (2009) classified as "small"

countries with a population up to a quarter of the most populated Member State and more than a half were classified as a "large" country.

Using a different measure, Symeou (2011) used a Size Index based on three variables (population, arable area and GDP) to divide countries in the European Union into small and large.[1]

In a different direction, Napoletano and Gaffard (2009) used the average of the size, measured in terms of GDP and Population, to distinguish the different groups of countries. Although they used these two different measures, both provided the same group of small and large countries.

### 2.1.3. Subsidiary Performance

The term performance is a very common one in the academic literature, however its definition is not very linear due to its many meanings.

In the 60´s, the term "performance" was very associated to the way the firms were able to exploit the environment and use their limited resources (Gavrea, Ilies and Stegerean, 2011). Later in years 80s and 90s, this definition became more complex than initially considered. According to Neely, Gregory and Platts (1995), the measure of performance is the process of satisfying the customers with better effectiveness and efficiency. While effectiveness corresponds to the achievement of the customer's necessities, the latter is the measure of how the economic resources are used with a given level of customer satisfaction. In this context, profit became one of the many measures of performance.

The performance of a firm can be measured by different criteria and the most used is mainly the combination of profit, market and growth (Dahms, 2017).

[1] Size Index=100/3(P_i/P_max +A_i/A_max +Y_i/Y_max ) where, P_i , A_i and Y_i are population, arable area, and GDP for economy i. P_max, A_max and A_max are the respective maximums. The index's median acted as threshold for small economies.

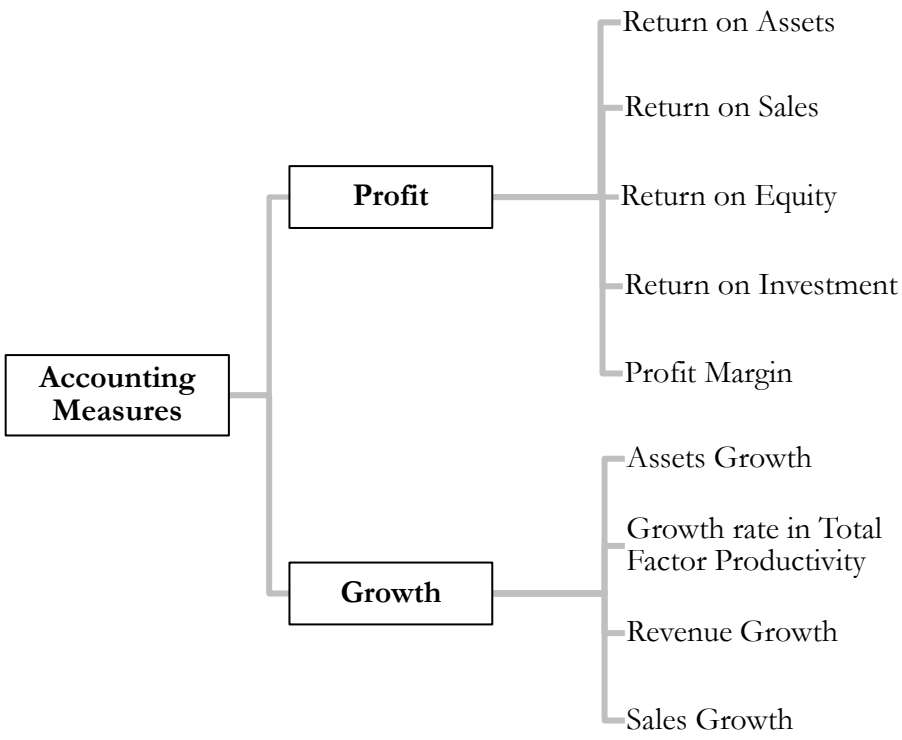
Following Venkatraman and Ramanujam (1986) profit is the firm´s ability to generate returns. The most used ratios to demonstrate the capability of the firm to generate such returns are the following: Return on Assets (ROA) calculated through the net income over total assets; Return on Sales (ROS) determined by dividing net income by sales; Return on Equity (ROE) defined as the net income divided by the total shareholders equity; Return on Investment (ROI) that measures the amount of return of an investment comparative to the investment´s cost; and Profit Margin (PM) as the net profit divided by sales (Al-Matari, Al-Swidi and Fadzil, 2014; Capon, Farley and Hoenig, 1990; Venkatraman and Ramanujam, 1986).

Measuring performance through growth rates is important, because in this way we are able to analyze the evolution over the years and see if the firm was able to increase its size and this can be measured with regards to some variables as assets, total factor productivity, and sales (Brouthers, 2002; Marano, Arregle, Hitt, Spadafora and Essen, 2016; Venkatraman and Ramanujam, 1986).

Finally, the market performance measures can be distinguished from the accounting based measures because of its long term vision (Dossi and Petelli, 2008). According to Wahla, ShahSyed and Hussain (2012) this kind of measures has a direct influence on the stakeholder´s expectations, regarding the future of the firm´s performance. The typical indicators are the Market Share, Tobin's Q, that represents the ratio of the market value of firm´s assets; Market Value Added (MVA), as being the difference between the market value and book value of Equity; Market-to-Book Value (MBV), which compares the market capitalization to the firm´s market value and Price-Earnings Ratio, that measures the current share price in respects to its per-share earnings (Al-Matari et al., 2014; Marano, et al., 2016).

In the literature, it is found that the profit measures are one of the most used to measure financial performance, followed by the growth measures (Gok and Peker, 2016; Venkatraman and Ramanujam, 1986). A summary of these two categories of the accounting performance measures can be found in Figure 1.

**Figure 1 -** Categories of Accounting Measures of Performance




**Source:** Own elaboration based on Capon et al., 1990

### 2.2. Subsidiary Performance Determinants: Theoretical Analysis

Understanding the determinants of a subsidiary performance has an increase importance for policymakers. This is because if the subsidiary accomplishes an increase in performance, it will have an increase in the investment from headquarters' and guarantee its survival (Dahms, 2017).

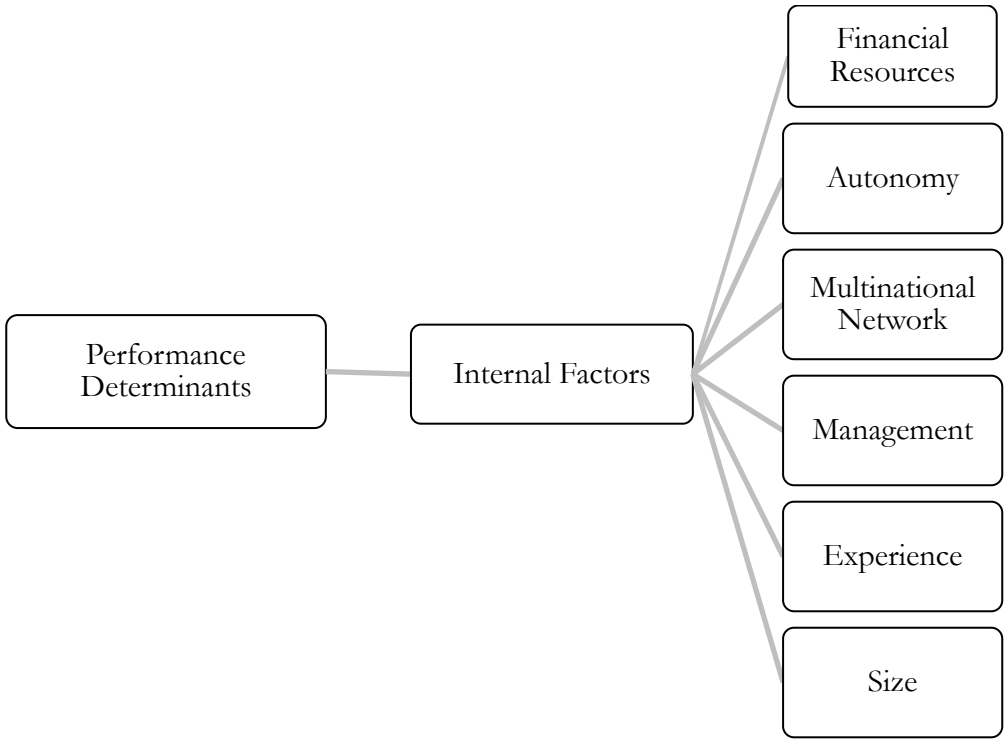
The determinants of subsidiaries performance can be seen as the interaction of two types of factors: internal and external factors. The internal factors are related to the firm-specifics advantages (FSA) and the external factors concern the country-specific advantages which include location factors and industry factors (Hansen and Gwozdz, 2013; Lee and Rugman, 2011). Dividing performance determinants into the two categories is justified once each one corresponds to different theoretical bases. While internal factors belong to resource-

based theory, external factors are supported by industrial organization theory (Dunning and Ludan, 2008). These two categories of factors are explored in the next subsections.

### 2.2.1. Internal Factors: Subsidiary characteristics

There are two main theories to identify the relationship between internal factors and subsidiary´s performance (Dunning and Ludan, 2008). The resource based theory postulates that the rare, valuable and hard to imitate resources (eg. autonomy, management, subsidiary experience and size) are the main foundation of competitive advantage for firms. Furthermore, the knowledge based theory states that any knowledge transfer (eg. networks) within the MNE network is likely to be one of the main specific advantages of subsidiaries (Dunning and Ludan, 2008). All of these characteristics are explored in Figure 2.

**Figure 2 -** Performance Determinants - Internal Factors




**Source:** Own Elaboration

The multinationals that decide to expand their business abroad become in disadvantage when compared with the local firms, as they have additional costs just because they are operating in a foreign market and these costs may influence the performance of the subsidiaries. According to Hsu, Chen and Caskey (2016) this is the liability of foreignness that the subsidiaries face when do their business abroad.

The concept of the liability of foreignness was first introduced by Hymer in 1976 and was conceptualized as a cost of doing business abroad. The author identified four main disadvantages firms face when doing business in foreign markets. First, firms do not have access to the same information as domestic firms have; second, there is a disadvantage in regard to fluctuation of foreign exchanges rates; third, the host government tends to benefit local firms and has a discriminatory behavior with foreign firms, and lastly, the home government might establish restrictions when firms decide to internationalize.

After Hymer, several other authors further analyzed his conclusions as per example, Zaheer (1995), who concluded that the environmental unfamiliarity, the cultural, political and economic differences between markets, geographic distance among other factors, contribute to the liability of foreignness in the same way as proposed by Hymer. Zaheer also shifted his research focus from identifying the determinants of the liability of foreignness to find the FSA that were needed to overcome these costs.

Existing literature (Hsu et al., 2016; Zaheer, 1995) reports that one of the FSA subsidiaries are able to accomplish in order to improve the performance is the knowledge creation and the capability of being autonomous regarding to the parent firm. The subsidiary will become more valuable for the parent firm and for the multinational as a whole. In other words, they develop less dependence on parent firms (Raziq, Borini and Battisti, 2013). This will result on the development of FSA for the subsidiary and in this way increase its performance. Makino et al. (2008) also support this view and consider that FSA (financial or managerial resources) are the key performance determinants to overcome the liability of foreignness.

Another internal factor that allows foreign subsidiaries achieve economies of scale and scope and consequently become more profitable is the access to the multinational network. The competitive advantages can be driven from organizational capabilities, such as the ability to learn or transfer managerial skills across these multinational networks. This way, the

subsidiary owns specific advantages that make them to overcome the liability of foreignness (Miller and Eden, 2006). However, this option can be very costly and can be hampered by differences in the economic environment between home and host country (Makino et al., 2008).

Bhatti et al. (2015) recognized that subsidiary management might influence the previous strategy affecting the subsidiary performance and therefore the way to deal with the liability of foreignness. Subsidiary management must provide conditions to facilitate the built of networks occurring in the host country. This learning process helps to improve trust in network relationships and, eventually, increases business performance through learning and knowledge acquisition.

According to Kipesha (2013) and Majumdar (1997), a key facet of knowledge acquisition is gaining knowledge from experience. According to Miller and Eden (2006), when a subsidiary is established abroad, not only will have to deal with the liability of foreignness but also will have to experience the liability of newness (time of establishment). Only with time and experience, the subsidiary will become more familiar within the host country environment and protect itself from a discriminatory treatment.

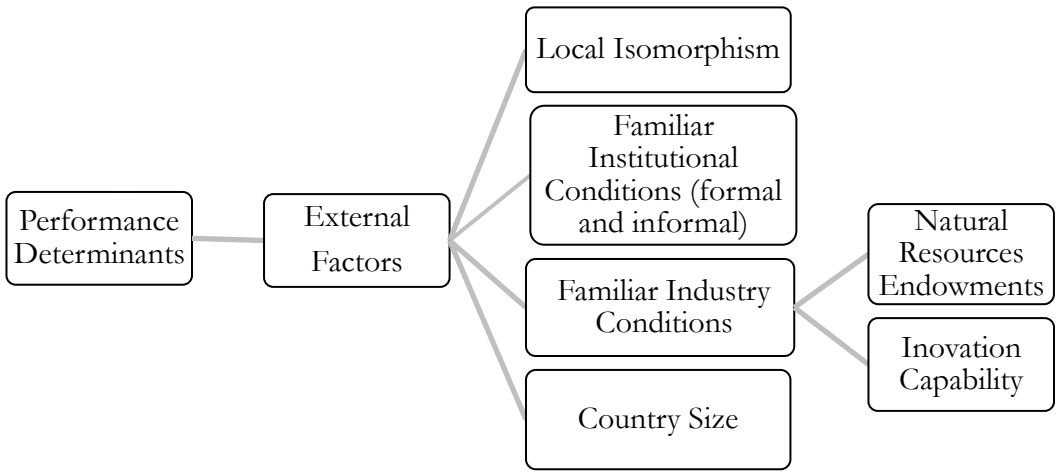
As stated by Ma, Zhu and Cai (2016), older firms perform better than younger firms. With the increase of experience, there is a knowledge flow between firms and the subsidiary might gain local legitimacy in the host economy and will be able to develop FSA and overcoming the liability of foreignness. They also found that firm´s age is mostly related with firm size. As a firm grows old, it becomes larger as well.

Size represents the resources and abilities that the subsidiary has within the local market. In the limit, it is the measure of the strength in the market (Johnston and Menguc, 2007). Chung and Beamish (2006) found that larger subsidiaries can develop more their specific advantages and, for this reason, perform better relatively to those smaller subsidiaries that could not develop those advantages. Also, larger subsidiaries can easily develop relationships with a greater number of foreign organizations, affording them access to a variety of resources (Chiao, Yu and Chen, 2008; Prahalad and Doz, 1981). In the literature, it is found that larger subsidiaries in absolute terms have better strategic position when compared with smaller ones and because of this, the size of the firm will influence its performance (Raziq et al., 2013).

### 2.2.2. External Factors: Country Characteristics

It is important to study the conditions of the country where the subsidiary is located because those conditions might have an impact on the performance of such subsidiaries (Christmann et al., 1999). In this section, we will develop four main external factors that influence subsidiary performance: local isomorphism, quality of institutions, industry conditions and host country size. These performance determinants can be seen in detail in Figure 3.

**Figure 3 -** Performance Determinants - External Factors




**Source:** Own elaboration

In order for the foreign subsidiaries to achieve success abroad, they need to have access to local advantages. One view dealing with the institutional perspective, states that local isomorphism can reduce the liability of foreignness and increase performance (Hsu et al., 2016). Local isomorphism is the process where firms within a sector become more similar. The subsidiary needs to be prepared to the norms and conducts of the local firms meaning that they should imitate their behavior to not be seen as foreign and take advantage of the local advantages. This Isomorphism can be imposed by local regulations as per example the

subsidiary´s pressure to adapt products to local preferences (Zaheer, 1995). However, imitating the behavior does not make the subsidiary necessarily more efficient, as according to Makino et al. (2008) it can limit the resource transfer of knowhow between the parent firm and the subsidiary.

Marano et al. (2016) emphasize the importance of the institutions for the performance of the firms. For these authors, institutions related to networks and culture play an important role in developing countries. Also for Ando and Ding (2014), the formal (laws and regulations) and informal institutions (norms arising from culture differences) that subsidiaries face when going abroad might influence the subsidiary performance and therefore the way to deal with the liability of foreignness. Those institutions might increase the costs of learning abroad. If the subsidiary finds unfamiliar institutional environments in host countries where political, economic and sociocultural rules differ from those of the home country, then this could be harmful for the subsidiary performance (Marano et al., 2016).

The institutions could be seen as a pillar for the function of markets because efficient institutions allow the reduction of transaction costs by organizing the economic activity and therefore allowing productivity gains (Pattnaik, Choe and Singh, 2015). Shirodkar and Konara, (2016) consider the quality of local institution as a precondition for the subsidiary survival. For these authors, also the subsidiaries doing business in the host country but with a similar institutional context of the home country facilitate economic transactions and knowledge transfer contributing to subsidiary performance.

In the same way, the industry conditions of the host country also influence the performance of the subsidiary and this relationship depends on industry similarity or dissimilarity between home and host country. If the subsidiary is operating inside an industry in the host country which is different from the one where the multinational in the home country is inserted, then the costs to adjust organizational structures and routines are higher than those in similar industries (Wu and Lin, 2009), which could be detrimental for affiliate performance. For these authors, the differences in subsidiary performance will depend on the competitive advantage the country has. In literature, we can find two different approaches that explain how an industry is influenced by the market characteristics (Makino, Isobe and Chan, 2004). The first one states that the abundance of natural resources (lands, mineral deposit,

water, etc.) in a particular industry helps creating competitive advantages between countries. If a country has abundance in certain resources, it will be able to produce cheaper goods inside an industry that uses this kind of factors creating comparative advantages. The second approach deals with the capacity the country has to create, develop and sustain innovation and technologies. The comparative advantage of the country is created when there is an environment where firms can benefit from and develop innovations. If these countries are able to create conditions where they help their own firms to innovate faster than their rivals, then they can use their advantages and in this way can achieve a superior performance (Makino et al., 2004).

For Makino et al. (2008) the interaction of industry effects and country effects has great influence on subsidiarity performance and so the country choice is as important as the choice of the industry in determining subsidiaries' performance.

Finally, Hsu et al. (2016) indicate that firms are able to take advantage of the country characteristics as per example its country size. Normally, countries with larger country size have a higher potential market and because of that, the firms operating in these markets can benefit with potential economies of scale (Christmann et al., 1999). Furthermore, larger size benefits the firms by increasing market competition between firms (Aghion, 2005). Firms in larger countries will have higher probability of getting higher market share in the world and so will be able to sell more and becoming more competitive. They also might get more assets and even employ more people than firms of smaller countries. That is why usually larger countries have bigger firms (Huang and Huang, 2014).

For Dunning and Ludan (2008), the potential size of the market will matter for the decision to invest in that specific country rather than another. In the same way, as stated by Garcia-Fuentes et al. (2016), market size of the host country is one of the most important indicators that influence foreign direct investment once the market size represents the quantities of goods and services that the host county possesses and if market size increases, it will become more attractive. It is expected that larger host countries become more attractive for investors and in this way be able to create comparative advantages for the subsidiaries located in those countries, increasing their performance.

Finally, according to some studies such as Barrios, Gorg and Strobl (2003) and Haufer and Wooton (1999), the firms and subsidiaries that operate on larger countries are expected to

have lower prices and higher profit margins, becoming more productive to sustain more varieties of products.

### 2.3. Subsidiary Performance Determinants: Summary of Empirical studies

On the present section, several empirical studies are addressed where subsidiaries' performance and foreign market conditions are taking into consideration. The process of identifying those studies was done by using two of the most known databases (Web of Science and Scopus) and we started our search using the key words "host country" and "subsidiary performance". In December 2017 this process in resulted in 55 papers, excluding the duplicated papers we found in both databases. After reading carefully the abstracts, we eliminated the ones that did not have subsidiary performance as a key research focus and we reduced the number to 31 papers. We were not able to find the full paper of two articles, so after reading the introduction of 29 papers we decided to keep 14 articles, which analyzed somehow different country characteristics and subsidiary performance and add 2 more articles that were found in the Google Scholar´s database (Brouthers, 2002 and Christmann et al., 1999). These 16 studies are synthetized in Table 1.

We will do our review considering studies where both size of a country and subsidiary performance are the research focus and classified the studies regarding their measure of country size and different ways of measuring performance. Studies are chronologically ordered.

**Table 1** - Summary of empirical studies on the effect of market size on subsidiary performance

| **Authors (year)** | **Period** | **Sample** | **Model** | **Measures of Performance (dependent variable)** | **Measure of country size (impact on performance)** | **Other variables included** | **Research focus** |
|---|---|---|---|---|---|---|---|
| Christmann et al. (1999) | 1980-1984 | 99 foreign subsidiaries<br>37 host countries | Multiple Regression Model | ROS<br>Market Share | Population (+) | Market average advertising-and-promotion-to-sales-ratio.<br>Market concentration<br>Market growth<br>Advertising share<br>Tax rate<br>Inflation rate | Effect of host country conditions on performance<br>Macro Level |
| Brouthers (2002) | 1993- 1995 | 178 subsidiaries<br>27 host countries (EU) | Questionnaire<br>Logistic Regression | Sales Growth | Market Potential (a) (+) | Firm Size – number of employees<br>Industry Sector<br>%Sales spent on R&D<br>International experience – number of years doing business abroad<br>Market Share | Entry mode choice and performance<br>Macro Level |
| Miller and Eden (2006) | 1995-1998 | 83 foreign subsidiaries in US<br>21 home countries | Panel Data | ROA | GDP growth rate (+/-) | Market experience<br>Local Density<br>Strategic conformity – bank asset strategies<br>Foreign subsidiary´s cost efficiency<br>Market share | Effect of local density on performance<br>Macro Level /Industry Level |
| Chan, Isobe and Makino (2008) | 1996–2001 | 6,985 foreign affiliates<br>38 host countries | Parametric Statistical Tests<br>Panel Data | ROS | Market seeking (b) (-) | Firm sales<br>Industry dummy<br>Local density<br>Labor cost<br>Geographic distance | Effect of Institutional development on performance<br>Macro Level |
| Wu and Lin (2009) | 2004-2006 | 1,596 Taiwan electronics subsidiaries | Logistic Regression | Subjective performance measure - Survey | Host country experience (+)<br>Environmental difficulties (-)<br>Cultural distance (-) | Firm size<br>R&D intensity<br>Ownership<br>Industry similarity | Effect of host country conditions on performance<br>Macro Level /Industry Level |
| Yu, Subramaniam and Cannella (2009 | 1995-2001 | 13 subsidiaries<br>27 countries | Generalized Least Squares | Competitive aggressiveness (c) | Growth rate of GDP (+)<br>Log of vehicle sales in a country (+)<br>Host market concentration(+) | Market share<br>Ownership<br>Cultural distance<br>Local regulatory restrictions<br>MNC size and age<br>International experience<br>MNC strategy | Effect of Rivalry Deterrence on performance<br>Macro Level |

**Table 1 (cont.)** – Summary of empirical studies on the effect of market side on subsidiary performance

| Authors (year) | Period | Sample | Model | Measures of Performance | Measures of country size (impact on performance) | Other variables included | Research Focus |
|---|---|---|---|---|---|---|---|
| Symeou (2011) | 1990-2007 | 54 subsidiaries 54 host Countries | Stochastic Frontier Analysis (SFA) | Investment in Assets | Measures of economic: Economy´s GDP<br>Measures of labor: population<br>Measures of natural resources size: arable area (+/-) | Total equivalent staff per capita Openness | Effect economy size on performance Macro Level /Industry Level |
| Dadzie, Larimo and Nguyen (2014) | 1994-2008 | 75 subsidiaries Ghana as host country | Questionnaire | ROS ROA | Population (+) | Firm size International experience Contractual risk Establishment and ownership mode Cultural Distance Country risk | Effect of host country conditions on performance Macro Level /Industry Level |
| Nguyen and Rugman (2014) | 2003-2007 | 504 subsidiaries 6 host countries (South East Asian) | OLS linear regression | Average market share growth Average ROCE Average sales growth Average profit growth | Host country's market attractiveness (d) (+) | Marketing capabilities General management capability Invested capital size Subsidiary domestic sales Subsidiary export sales Sector Subsidiary size Ownership Parent firm size | Effect of host country conditions on performance Macro Level /Industry Level |
| Song (2014) | 1990-2009 | 2,560 manufacturing foreign subsidiaries 43 host countries | Two stage least square (2SLS) | ROS | GDP growth rate (+) Cultural distance (-) Country risk (-) | Ownership Labor cost growth rate Parent firm size International experience Country/firm/industry dummies Currency appreciation/depreciation Intra firm sales/purchasing Stock price uncertainty Subsidiary investment amount | Effect of Exchange rate on performance Macro Level /Industry Level |

**Table 1 (cont.)** – Summary of empirical studies on the effect of market size on subsidiary performance

| Authors (Year) | Period | Sample | Model | Measures of Performance | Measures of country size (impact on performance) | Other variables included | Research Focus |
|---|---|---|---|---|---|---|---|
| Wu and Salomon (2014) | 1989-2010 | 189 foreign bank subsidiaries US as host country | Logistic regression | ROA | Local deposits (+) | Dummy foreignness<br>Host country Experience<br>Human Capital<br>Bank size<br>Number of local rivals<br>ROA | Liability of foreignness and performance<br>Macro Level /Industry Level |
| Beugelsdijk, Maseland, Onrust, van Hoorn and Slangen (2015) | 1983–2008 | 688 subsidiaries 40 host countries | Panel data | Aggregate sales of goods generated in host country by subsidiaries | GDP (+)<br>GDP per capita (+) | Geographic distance<br>K-S index<br>cultural distance<br>FDI stock as % GDP<br>Political stability - Henisz's score<br>Volatility of exchange rate | Cultural distance<br>Macro level |
| Hyun, Hoon Oh and Paik (2015) | 2005-2007 | 401 subsidiaries 35 countries | Hierarchical linear model | Labor productivity | log of the real GDP (+)<br>log of the population (-) | Institutional quality<br>size of parent firm<br>subsidiary size and age<br>Entry mode<br>Geographic and cultural distance<br>Property right protection | Effect of nationality composition on performance<br>Macro Level |
| Liu, Gao, Lu and Lioliou (2015) | - | 206 firms 58 host countries | Confirmatory factor analysis (CFA) model questionnaires | Profit growth<br>Sales growth<br>Subsidiary market share growth | Input localization (e) (+):<br>Local raw materials and components<br>Local human resource<br>Local financial capital culture | Marketing localization<br>industry risks<br>firm age and size<br>local experience<br>entry mode | Effect of location on performance<br>Macro Level |
| Pattnaik, Choe and Singh (2015) | 2001-2006 | 318 manufacturing subsidiaries 28 host countries | OLS linear regression | ROA | GDP growth rate (+) | Labor, product, capital market quality<br>political and social quality<br>institutional distance<br>R&D<br>subsidiary advertising intensity<br>subsidiary size and age<br>international experience | Effect of Institutional context on performance<br>Macro Level /Industry Level |

**Table 1 (cont.)** – Summary of empirical studies on the effect of market size on subsidiary performance

| Authors (Year) | Period | Sample | Model | Measures of Performance | Measures of country size (impact on performance) | Other variables included | Research Focus |
|---|---|---|---|---|---|---|---|
| Shirodkar And Konara (2016) | 2004-2012 | 10,562 firms 17 host countries | Generalized Least Squares | ROE | Growth rate of the host country (+) | Formal institutional distance<br>Voice and Accountability<br>Political Stability and Absence of Violence Government<br>Effectiveness<br>Regulatory Quality<br>Rule of Law<br>Control of Corruption<br>Ownership strategy<br>Host Country experience<br>Firm size and age<br>level of human capital income tax rate | Effect of Institutional distance on performance<br>Macro Level |

**Legend**:

ROS - Return on Sales; ROA - Return on Assets; ROE - Return on Equity; ROCE - Return on Capital Employed

(a) Likert-type question that asked about market potential of the target market. "The stability of political, social and economic conditions in the target market".

(b) Dummy exploring market opportunities for sales in local markets.

(c) Propensity of a firm to directly and intensely challenge rivals in order to maintain or improve its market position.

(d) Self-assess host country market attractiveness, in terms of market size, market growth and potential, demand, profitability and competition for their subsidiaries' products and/or services on a 7-point scale, from 1, very low to 7, very high.

(e) No country measures are taking into account in this study.

As is visible on Table 1, few empirical studies have focused on the impact of market size on the performance of the subsidiary. The ones that approaches this issue are mostly related with foreign market entry choice and do not have performance *per se* as the main purpose of the analysis (eg. Brouthers, 2002; Liu et al. 2015).

Focusing on the measures used, it is possible to identify that the financial measures (ROS, ROA and sales growth) are the most used ones as we have also identified in Section 2 and country size can be measured using different criteria (Population, GDP, GDP per capita). These can be seen in the above studies like Beugelsdijk, (2015) and Christmann et al. (1999).

Almost all of the presented studies have more than one country in analysis and have a temporal range in between 1980 and 2012, being 2 the minimum of years analyzed and 25 the maximum. Regarding the sample, we find studies related with macro level which normally analyze and compare the firm´s performance differences between countries regardless of any industry. In the industry level, the focus is more on the firms allocated to a specific industry. The main industry focus on these studies is the manufacturing industry, followed by the bank industry.

In the same way, when looking to the method used in the empirical papers, we found that several methods were used but the most used ones are regression models, more specifically OLS, GLS and Panel Data.

The size of country is considered to be positively related with subsidiary´s performance. In fact, 6 out of 9 articles that analyze directly or indirectly country size indicate a positive effect on subsidiary performance and only 3 (Miller and Eden, 2006; Symeou, 2011 and Hyun et al. 2015) appear to have a mixed effect (both positive and negative). Christmann et al. (1999), Dadzie el al. (2014) and Wu and Salomon (2014), using return on sales (ROS) and return on assets (ROA) as a proxy for profitability and population for market size, found a positive relationship between country size and performance, using a single industry for their analysis. In the same way Brouthers (2002) using both manufacturing and services industry found a positive relationship between the two variables. Beugelsdijk et al. (2015) also found a positive relationship between GDP and subsidiary performance, measured by the foreign subsidiaries' aggregate sales generated in host country by subsidiaries.

Miller and Eden (2006) and Symeou (2011) used a single industry and their results suggest that larger market size is normally a necessary but not a sufficient condition for better

performance. For Hyun et al. (2015) the impact of host country size on subsidiary's performance depends on the country size measure. When measured by GDP the impact is positive, but when measured by population, the effect on performance (measured as total labor productivity) is negative.

Regarding the subsidiary characteristics, the most common variables used as proxies are the subsidiary´s age, the ownership mode and human capital.

# 3. Methodology

This Chapter is focused on the formulation of the hypotheses and on the methodology used (Section 3.1.) in order to ascertain if our results go in the same direction as the literature. Section 3.2. provides the definition of variables used, source of data and description of the processes followed to obtain the final sample of subsidiaries. A detailed descriptive analysis of our data is presented in Section 3.3.

## 3.1. Research Hypotheses and Methodology

Taking into account the literature review we have explored in Section 2, there are sufficient arguments to propose the following hypotheses:

**H1:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries.

**H1a:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries regardless of the performance measures.

**H1b:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries regardless of the country size measures.

The methodology for this study was chosen having in consideration the main objective of the analysis, which is to compare the performance of foreign subsidiaries located on large countries from the ones located on small countries and to identify if there are any substantial differences taking into account different performance measures and different country size measures. For this purpose, a non-parametric test was chosen to test the hypotheses designed above. The reason why we decided to choose a non-parametric test is because, as we will see in Section 4, *"*Their nonparametric nature makes them appropriate for data that don't meet the assumptions of parametric analyses. These include data that are skewed, non-normal, contain outliers (…)*"* (Mangiafico, 2016, p.228).

## 3.2. Definition of variables, source of data and sample of firms

### 3.2.1. Variables

Previous studies that focused on subsidiary´s performance used similar variables to the ones we choose to use in this study. Regarding the selection of performance variables, we followed the empirical literature review described in section 2.1.3. and we will use three different profit measures: The return on assets (ROA) (similarly to Chan et al., 2008; Christmann et al., 1999; Dadzie et al., 2014; Song, 2014), Return on Equity (ROE) (like Shirodkar and Konara, 2016) and Return on Sales (ROS) (as in Chan et al., 2008; Christmann et al., 1999; Dadzie et al., 2014 and Song, 2014). We will also use the performance measure Assets Growth as criteria for subsidiary performance (Brouthers, 2002; Liu et al., 2015; Nguyen and Rugman, 2014). Table 2 presents the relevant information regarding these variables as how they are calculated and the source of the data.

Country size will be measured with three different proxies: Population, GDP and GDP per capita of the host country, (similarly to Beugelsdijk et al., 2015; Christmann et al., 1999 and Hyun et al., 2015). The dummy proxies presented in Table 2 for the measured of Country variables represents the division into small and large countries. This division will be explained in detail in section 3.3. Finally we will also include two common variables used in the literature (Brouthers, 2002; Dadzie, et al., 2014; Liu et al., 2015; Nguyen and Rugman, 2014; Pattnaik et al., 2015; Shirodkar and Konara, 2016; Wu and Lin, 2009) regarding subsidiary´s characteristics: Size and Age.

**Table 2-** List of Variables and their proxies

| Variable Type | Name | Proxy | Source of data |
|---|---|---|---|
| Profit Variables | ROA | Return on Assets = Net Income / Total Assets (%) | Amadeus |
| | ROE | Return on Equity = Net Income / Total Asset (%) | Amadeus |
| | ROS | Return on Sales = Net Income / Total Shareholder Equity (%) | Amadeus |
| | AssetsGrowth | Annual assets growth rate (%) | Amadeus |
| Country Variables | GDPcountry | Dummy for country(=1 if large; =0 if not) | World Bank |
| | GDPpercapita | Dummy for country(=1 if large; =0 if not) | World Bank |
| | Popcountry | Dummy for country(=1 if large; =0 if not) | World Bank |
| Other Variables | Size | Number of Employees | World Bank |
| | Age | Number of years | World Bank |

**Source:** Own Elaboration

### 3.2.2. Sample

In order to test the hypotheses outlined in the above section, a sample regarding the subsidiaries of 28 European countries was extracted from the Amadeus (Bureau Van Dijk, 2017) database on March 2018. Amadeus is a database that contains financial information of 14 million companies across Europe. The observations were exported for five years, from 2011 to 2015. We have excluded the last two years, 2016 and 2017, once we found that the information for these years was not complete and so would make our data inaccurate.

Following UNCTAD (2011) and as we have seen in section 2.1.1, we will identify multinational enterprises by choosing the active firms owned by a foreign stakeholder, wherein it has the majority ownership in the company. The direct or total participation will have to be

greater than 50 %. We will also take into consideration to include only subsidiaries which the number of employees would be greater than 10 and annual turnover greater than 2 million euros for at least one of the years in analysis, in order to exclude micro enterprises[2].

As we will be focusing only in Manufacturing Industry, we only kept the observations regarding the information of NACE code related with this industry. We have also excluded the subsidiaries for which we did not have information about the NACE code.

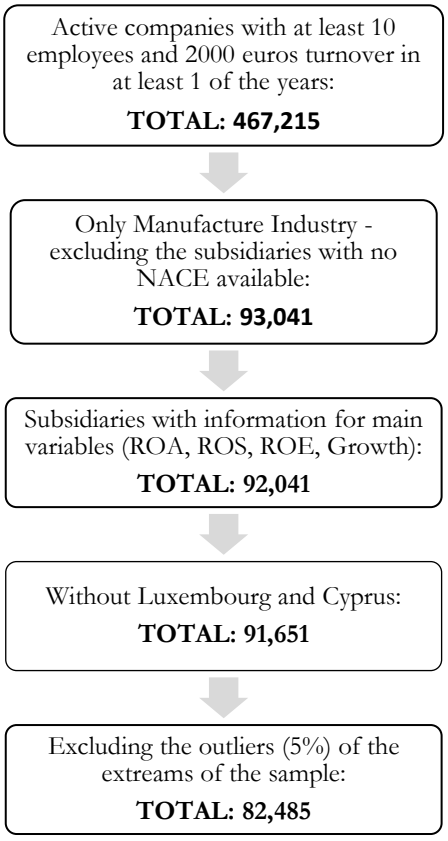
After collecting the relevant data, we found that for around 1000 subsidiaries we did not have enough information of the main variables for some years. As we wanted to have a robust data over the entire period, the subsidiaries that did not have accounting data for the reviewed period and for the main variables were excluded. Moreover, for two countries (Cyprus and Luxembourg) only few firms were included in our sample so we decided also to drop these observations as they were not relevant for global study.

In order to account for possible outliers in our data, we eliminated 5% of the extremes of our sample. Under these conditions, we obtained a final sample of 16,497 subsidiaries, which correspond to 82,485 observations related with manufacture industry in the period of 2011 until 2015.

Figure 4 summarizes all the steps used in data sample treatment, as well as its implications in number of observations.

[2] European Comission, considers that micro firms are those that have less than 10 employees and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million (EC, 2013). The aim of exclusion of micro firms was to have a more robust data sample.

**Figure 4 -** Process of Treatment of Total Sample




Summarizing the distribution of subsidiaries by manufacturing subsectors and by country are presented in Table 3 and 4 respectively.

**Table 3-** Distribution of subsidiaries per sectors (Nº and %)

| Sector | Sector Description | Total | % |
|---|---|---|---|
| **Sector_10** | Manufacture of food products | 1,266 | 7.67 |
| **Sector_11** | Manufacture of beverages | 258 | 1.56 |
| **Sector_12** | Manufacture of tobacco products | 55 | 0.33 |
| **Sector_13** | Manufacture of textiles | 375 | 2.27 |
| **Sector_14** | Manufacture of wearing apparel | 290 | 1.75 |
| **Sector_15** | Manufacture of leather and related products | 181 | 1.09 |
| **Sector_16** | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 337 | 2.04 |
| **Sector_17** | Manufacture of paper and paper products | 534 | 3.23 |
| **Sector_18** | Printing and reproduction of recorded media | 32 | 0.19 |
| **Sector_19** | Manufacture of coke and refined petroleum products | 67 | 0.40 |

| | | | |
|---|---|---|---|
| **Sector_20** | Manufacture of chemicals and chemical products | 1,529 | 9.26 |
| **Sector_21** | Manufacture of basic pharmaceutical products and pharmaceutical preparations | 528 | 3.20 |
| **Sector_22** | Manufacture of rubber and plastic products | 1,499 | 9.08 |
| **Sector_23** | Manufacture of other non-metallic mineral products | 827 | 5.01 |
| **Sector_24** | Manufacture of basic metals | 567 | 3.43 |
| **Sector_25** | Manufacture of fabricated metal products except machinery and equipment | 1,766 | 10.70 |
| **Sector_26** | Manufacture of computer, electronic and optical products | 1,054 | 6.38 |
| **Sector_27** | Manufacture of electrical equipment | 1,029 | 6.23 |
| **Sector_28** | Manufacture of machinery and equipment n.e.c. | 2,240 | 13.57 |
| **Sector_29** | Manufacture of motor vehicles, trailers and semi-trailers | 1,104 | 6.69 |
| **Sector_30** | Manufacture of other transport equipment | 246 | 1.49 |
| **Sector_31** | Manufacture of furniture | 243 | 1.47 |
| **Sector_32** | Other manufacturing | 401 | 2.43 |
| **Sector_33** | Repair and installation of machinery and equipment | 69 | 0.41 |
| | **Total manufacture firms** | 16,497 | 100.00 |

**Source:** Own elaboration based on NACE Codes

The industry sector that has a higher number of firms is sector 28, "Manufacture of machinery and equipment n.e.c." with 13,57% of the total sample and the industry sector that is less represented is sector 12, "Manufacture of tobacco products" with only 0,33% of the firms.

**Table 4 -** List of subsidiaries by Country

| Country | Code | Number of subsidiaries | % |
|---|---|---|---|
| Austria | AT | 301 | 1.82 |
| Belgium | BE | 830 | 5.03 |
| Bulgaria | BG | 274 | 1.66 |
| Croatia | HR | 138 | 0.84 |
| Czech Republic | CZ | 1,334 | 8.09 |
| Denmark | DK | 181 | 1.10 |
| Estonia | EE | 172 | 1.04 |
| Finland | FI | 255 | 1.55 |
| France | FR | 1,355 | 8.21 |
| Germany | DE | 1,327 | 8.04 |
| Greece | GR | 118 | 0.72 |
| Hungary | HU | 358 | 2.17 |

| | | | |
|---|---|---|---|
| Ireland | IE | 140 | 0.85 |
| Italy | IT | 1,625 | 9.85 |
| Latvia | LV | 140 | 0.85 |
| Lithuania | LT | 145 | 0.88 |
| Netherlands | NL | 292 | 1.77 |
| Poland | PL | 243 | 1.47 |
| Portugal | PT | 394 | 2.39 |
| Romania | RO | 1,234 | 7.48 |
| Russia | RU | 1,351 | 8.19 |
| Slovakia | SK | 599 | 3.63 |
| Slovenia | SI | 182 | 1.10 |
| Spain | ES | 1,069 | 6.48 |
| Sweden | SE | 566 | 3.43 |
| United Kingdom | UK | 1,874 | 11.36 |
| | Total | 16,497 | 100.00 |

**Source:** Own Elaboration

After comparing the percentage of firms per country, we can see that the country that has the biggest number of subsidiaries is UK with 1,874 firms (11.36%) which is 16 times higher than the country with the smallest number of subsidiaries, Greece, with only 118 subsidiaries (0.72%).

### 3.3. Descriptive Analysis

In this section, we provide more detailed information regarding the analysis of our sample. First, we will present a general descriptive statistic of our total sample, as well as individually by country. Then, we will describe how we will compute our country size variable.

In order to analyze better the variables in discussion, we performed a brief descriptive statistic which is presented in Table 5.

**Table 5 -** Descriptive statistics (2011-2015)

| | Variables | Obs. | Mean | Sd | Min | Max |
|---|---|---|---|---|---|---|
| **Firm variables** | **ROE (%)** | 73,999 | 10.60 | 58.65 | -995.3 | 996 |
| | **ROA (%)** | 78,778 | 4.79 | 12.79 | -99.81 | 99.99 |
| | **ROS (%)** | 61,957 | 2.56 | 11.85 | -240.3 | 907.9 |
| | **Assetsgrowth (%)** | 62,512 | 6.99 | 31.13 | -89.80 | 510.4 |
| | **Size** | 77,541 | 340.5 | 1,424 | 0 | 113,667 |
| | **Age** | 82,455 | 28.70 | 20,46 | 0 | 195 |
| **Country variables** | **Population** | 82,485 | 45,275 | 39,554 | 1,315 | 144,096 |
| | **GDP** | 82,485 | 1,424,091 | 1,222,982 | 22,566 | 3,890,606 |
| | **GDP_percapita** | 82,485 | 32,947 | 7,347 | 15,676 | 60,818 |

**Source:** Own Elaboration based on STATA output

Observing the results of this table, as well as the graphs over country and over year (Graphics 1 and 2), we can conclude that the maximum of 996 % ROE is related with a company that belongs to Russia for year of 2012 and this value is much higher than the one presented for the minimum of -995.3% for year 2014 for a subsidiary that belongs to Czech Republic.

Overall, and in terms of ROE, we have one country with negative average, as seen in Graphic 1. The highest value for this variable is for Latvia (17.87 %), while the smallest value for this variable is Greece with a negative % of 2.22.

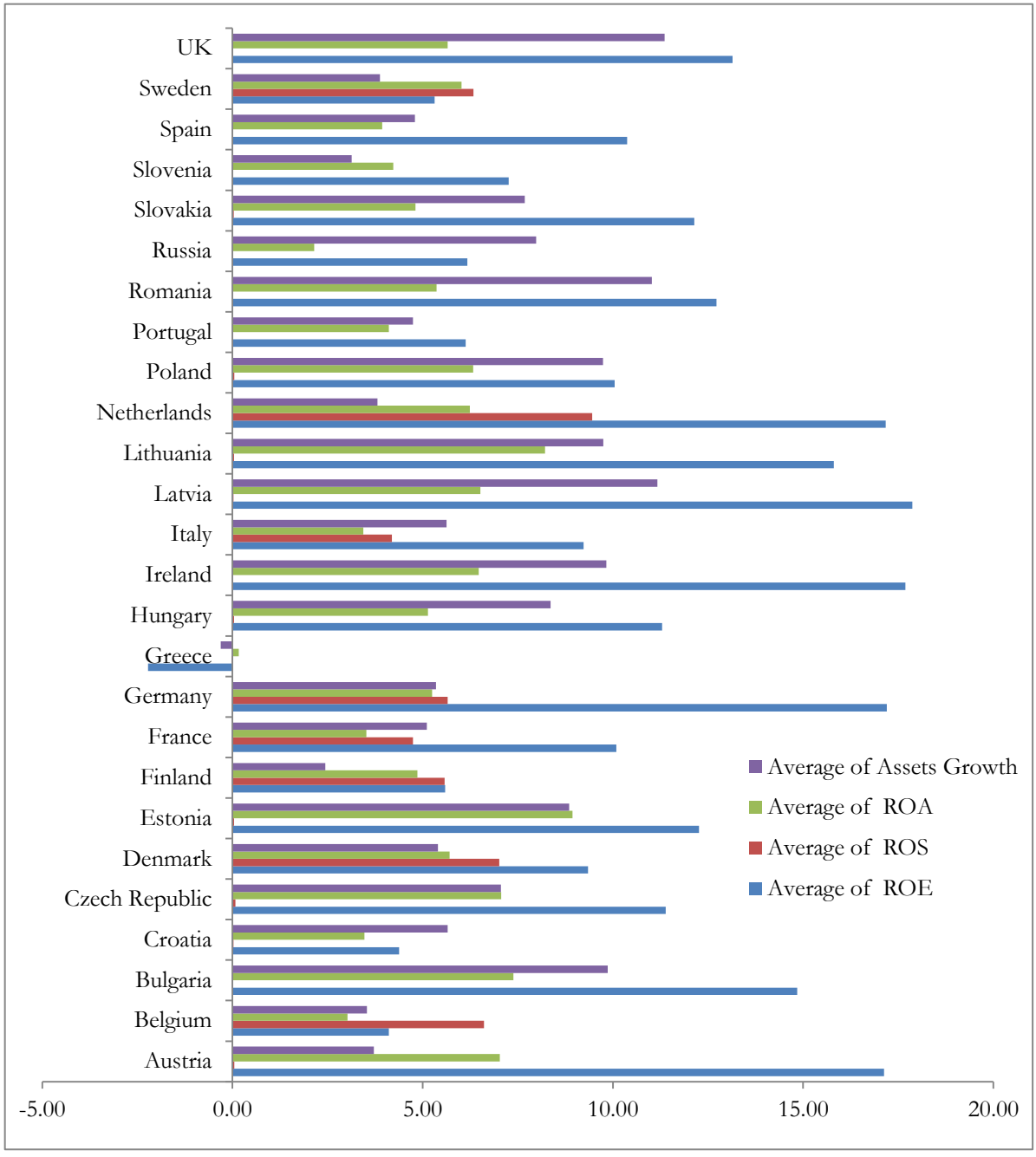
For the ROA variable, the maximum of 99.99% corresponds to a subsidiary of UK for year 2012, while the minimum value is related with a Portuguese subsidiary for the year 2013. As we can see, there is a higher dispersion of the results for these variables and the mean for all of the countries have a positive value for this variable. The highest value for the mean is represented by Estonia, while the smallest mean is related with Greece.

Focusing on ROS variable, the maximum value for this variable is 908 % which is related with a subsidiary located in France, in 2014, and for the other side of the spectrum the minimum value (-876%) for this variable is related with Romania, in 2011. On the average side, almost all the countries have a positive average and the biggest value in this respect is for Netherlands, while the smallest value for the average of ROS is for Greece. In respects to sales variable, no values were available in AMADEUS database for UK, Russia and Ireland which limited the number of subsidiaries for these countries and therefore we were not able to

calculate the ROS ratio. The negative averages for Greece and Bulgaria appear to be affected by the negative values of net income for some years.

Regarding Assets Growth, the minimum for this variable is -89.80% that occurred in the transition of year 2012 to 2013 in Netherlands while the maximum is 510.4% which happened between 2014 and 2015 in UK. The country that represents the highest assets growth is UK and Greece is the country with the smallest assets growth during the 5 years under analysis.

**Graphic 1 -** Average of ROE, ROA, ROS and Assets Growth per Country (%)

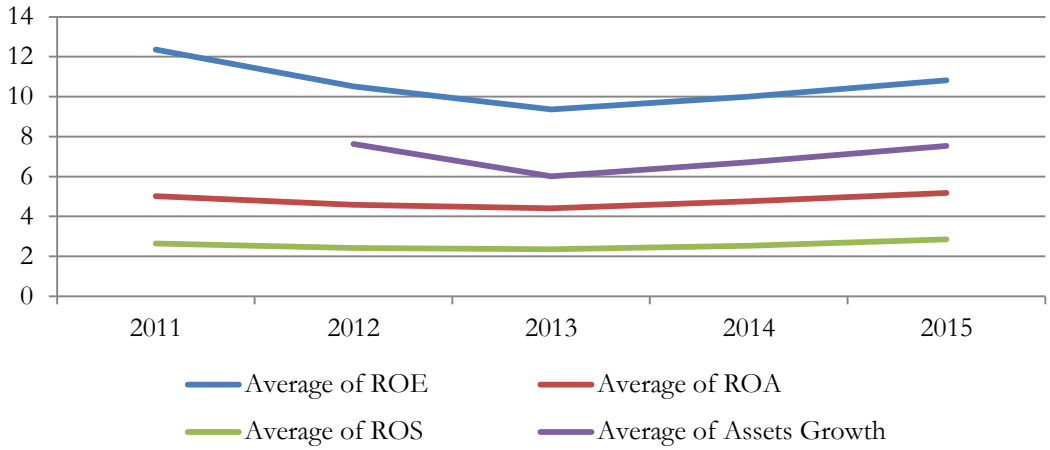



**Source:** Own Elaboration based on STATA outputs

Concerning the evolution of the variables over the period 2011-2015 represented in Graphic 2, all the three profit variables had a decreasing trend during 2011 and 2013 and then

they started to increase until 2015, (this could be related with the economic crisis in Europe that took place during these years).

**Graphic 2 -** Evolution of ROS, ROA, ROE and Assets Growth over year




**Source:** Own Elaboration based on STATA outputs

In Table 6 we present the means for the country size variables and other variables that represent two subsidiaries' characteristics for each country.

The largest country in terms of Population is Russia, in terms of GDP is Germany and in terms of GDP per capita is Denmark. The smallest country in terms of both GDP and Population is Estonia and in terms of GDP per capita is Bulgaria. These results follow the same conclusions of chapter 2.1.2, when we stated that the definition of country size is very difficult to define, once it can be measured by different criteria.

In order to divide countries in two different groups; small and large ones, we followed the empirical literature and we decided to follow the method used by Napoletano and Gaffard (2009) as seen in section 2.1.2. In this way, countries with the variable for country size (Population/GDP/GDP per capita) above the average of total sample will be considered as large countries, while the ones with population/GDP/GDP per capita below the average of the total sample will be considered as small countries.

Following the above description to divide countries according to their size, when measuring country size in terms of Population and GDP, we have identified the same number of small and large countries; 20 small countries and 6 large countries. When measuring country size as GDP per capita, we have a slightly different result. With this measure, 11 countries are identified as large and 15 are small. These results can be found on Table 6.

Regarding other subsidiary characteristics such as experience and size, the subsidiaries have on average 29 years old, which can be considered old firms, and if for one side it can be seen as indication of lower performance due to rigidity, for other side they can be considered as wiser, leading to an increase on performance.

In regard to size, the average number of employees is 340 per subsidiary, which implies that our subsidiaries are considered to be large firms, explanation that is provided by the European Commission (2003), which considers small subsidiaries, firms with 10 until 49 employees; medium-sized enterprises as subsidiaries with 50 to 249 employees and larger enterprises, the ones with more than 250 or more people employed.

**Table 6**- Descriptive statistics (mean) per country

| Country | Population (Thousand) | GDP (Million) | GDP_percapita USD | Size (Pop) | Size (GDP) | Size (GDP Per Capita) | Age (Years) | Size_Empl (N) |
|---|---|---|---|---|---|---|---|---|
| Austria | 8,465.53 | 418,912.60 | 41,889.52 | Small | Small | Large | 34.09 | 236.30 |
| Belgium | 11,157.20 | 506,325.20 | 39,462.75 | Small | Small | Large | 38.25 | 233.36 |
| Bulgaria | 7,263.60 | 54,801.80 | 19,408.86 | Small | Small | Small | 15.11 | 316.87 |
| Croatia | 4,249.60 | 56,815.80 | 22,881.69 | Small | Small | Small | 24.33 | 186.13 |
| Czech Republic | 10,518.20 | 207,874.60 | 29,794.09 | Small | Small | Small | 19.97 | 324.56 |
| Denmark | 5,620.20 | 333,805.20 | 42,310.38 | Small | Small | Large | 35.69 | 318.13 |
| Estonia | 1,319.20 | 24,028 | 27,511.50 | Small | Small | Small | 22.24 | 173.16 |
| Finland | 5,435.80 | 261,086.60 | 38,027.88 | Small | Small | Large | 28.90 | 348.82 |
| France | 65,825.60 | 2,729,336 | 36,429.86 | Large | Large | Large | 34.80 | 301.49 |
| Germany | 80,802.40 | 3,664,082 | 41,034.77 | Large | Large | Large | 32.71 | 437.44 |
| Greece | 10,965.20 | 241,179.80 | 26,041.52 | Small | Small | Small | 22.58 | 223.44 |
| Hungary | 9,896 | 133,370 | 25,444.87 | Small | Small | Small | 22.87 | 523.67 |
| Ireland | 4,632 | 250,538.80 | 49,061.42 | Small | Small | Large | 28.72 | 167.53 |
| Italy | 59,874.20 | 2,092,841 | 34,176.67 | Large | Large | Large | 31.74 | 263.55 |
| Latvia | 2,015 | 28,980.60 | 23,719.29 | Small | Small | Small | 17.54 | 109.75 |
| Lithuania | 2,961.60 | 44,553 | 26,674.09 | Small | Small | Small | 18.31 | 177.84 |
| Netherlands | 16,811 | 845,403.40 | 43,097.84 | Small | Small | Large | 41.88 | 737.90 |
| Poland | 38,032.60 | 515,192 | 25,624.29 | Small | Small | Small | 27.60 | 575.16 |
| Portugal | 10,457.40 | 223,277 | 27,426.93 | Small | Small | Small | 32.43 | 195.30 |
| Romania | 19,982.20 | 184,996.80 | 21,863.71 | Small | Small | Small | 16.02 | 315.24 |
| Russia | 143,516.40 | 1,998,221 | 26,346.11 | Large | Large | Small | 16.84 | 433.64 |
| Slovakia | 5,411.80 | 95,704.20 | 28,015.63 | Small | Small | Small | 17.11 | 298.81 |
| Slovenia | 2,058.40 | 47,746.80 | 29,190.21 | Small | Small | Small | 24.65 | 228.91 |
| Spain | 46,611.80 | 1,352,128 | 31,660.40 | Large | Large | Small | 34.49 | 341.96 |
| Sweden | 9,612.60 | 551,493.20 | 41,829.21 | Small | Small | Large | 42.87 | 277.49 |
| UK | 64,165.40 | 2,786,000 | 37,598.12 | Large | Large | Large | 36.02 | 428.96 |
| Total | 45.275.40 | 1,424,092 | 32,947.02 | | | | 28.70 | 340.49 |

**Source:** Own Elaboration based on STATA output

# 4. Empirical Results

In this chapter, we will present and discuss the results of the non-parametric test used to compare subsidiary's performance within different groups of countries.

In Section 4.1. we will explain the test used to test our hypothesis and in section 4.2. the empirical results are presented and discussed.

## 4.1. Non-Parametric test

This section provides a comparison between subsidiary performances of two different groups of countries (small and large). The t test for two independent samples would have been the best option, having in consideration the main objective of the analysis. However, this test assumes a normal distribution (Mangiafico, 2016). For this reason, before deciding the appropriate test to use for our scenario, we need to know if our sample follows a normal distribution or not. Using the Shapiro-Wilk test, we conclude that our data does not follow a normal distribution and for this reason the non-parametric tests are the ones we should follow. The results can be seen on Appendix (Table A1) which shows a p-value<0.01 for all the variables.

Taking into consideration the purpose of our study and the data sample, we got the conclusion that the better test to use was Mann Whitney test. Mann Whitney test is a non-parametric test used to compare two independent variables which came from the same population and used to identify if the mean of the two samples is equal or not. The statistical analysis we performed were done using STATA version 12.0.

## 4.2. Results

The results of the Mann Whitney test are presented in the Table 8.

We will compare both performance variables and subsidiary characteristics between the two groups of countries. Once we obtained different groups of small and large countries

depending of the variable chosen for country size, we will also confirm if there will be any changes in this aspect.

Grouping the countries according to each size category (Table 6 and 7), it is noted that more than 50% of the subsidiaries are located in large countries, when the country size is measured by Population and GDP_per capita. Only for GDP as measure of country size provides more subsidiaries for smaller countries (around 54%). For the performance measure in terms of ROA, the group of small countries have a higher average compared with the larger group of countries. For the remaining profit variables (ROE and ROS), for assets growth and the other country variables, the group of large countries appears as having a larger value for the mean, than smaller group of countries.

**Table 7 -** Number of subsidiaries per Category

| Category | Small | % | Large | % | Total |
|---|---|---|---|---|---|
| Population | 7896 | 47.86 | 8601 | 52.14 | 6497 |
| GDP | 8965 | 54.34 | 7532 | 45.66 | |
| GDP_perCapita | 7751 | 46.98 | 8746 | 53.01 | |

**Source:** Own Elaboration based on STATA outputs

**Table 8 -** Mann Whitney test – Country Groups

| Variables | Category_pop | | Pvalue | Category_GDP | | Pvalue | Category_GDPcapita | | P-value |
|---|---|---|---|---|---|---|---|---|---|
| | Small | Large | | Small | Large | | Small | Large | |
| ROE | 10.30 | 10.90 | 0.0000 | 10.31 | 10.98 | 0.0000 | 10.35 | 10.83 | 0.0003 |
| ROA | 5.55 | 4.04 | 0.0000 | 5.35 | 4.06 | 0.0000 | 4.95 | 4.63 | 0.8867 |
| ROS | 1.84 | 3.67 | 0.0000 | 1.61 | 4.70 | 0.0000 | 0.03 | 5.23 | 0.0000 |
| Assets Growth | 6.83 | 7.10 | 0.0000 | 6.59 | 7.45 | 0.0000 | 7.64 | 6.34 | 0.7054 |
| Experience | 25.87 | 31.30 | 0.0000 | 26.90 | 30.85 | 0.0000 | 21.61 | 34.99 | 0.0000 |
| Size_employees | 309.12 | 370.66 | 0.0000 | 313.13 | 375.09 | 0.0073 | 332 | 348.27 | 0.0000 |

**Source:** Own Elaboration based on STATA outputs

Taking into consideration the results of Mann Whitney test from Table 8, the performance of subsidiaries located in large countries measured by ROE, ROS and Assets Growth is, on average, higher than the subsidiaries located in small countries, with the difference being statistically significant ($p<0.01$), regardless of the country size measure used. These results follow the literature (e.g. Christmann et al. (1999), Dadzie el al. (2014) and Wu and Salomon (2014)) and in this way we can accept the hypothesis H1a where we said that regardless of the country size measure, the subsidiaries located in larger countries perform better than the ones located in small countries.

For Assets Growth, when country size is measured as GDP per capita, although the average is higher for subsidiaries located in smaller countries, the p-value is higher than 0.01, and for this reason we cannot conclude that a significant difference exists for the two means.

The same conclusion cannot be taken with the performance variable measured as ROA. The subsidiaries located in the group of small countries in terms of GDP and Population have a better performance from the ones located in the large group of countries with the difference being statistically significant ($p<0.01$). When size of country is measured by GDP per capita and performance is measured by ROA, the difference is not statistically significant ($p>0.01$) and for this reason we cannot conclude any inference regarding the difference of subsidiary performance between the large and small countries. Previous studies have recognized that ROA is not the right performance measure to adopt for foreign affiliates once it "may vary significantly across host countries due to differences in the market value of the asset (capital) among countries and may not correctly reflect the economic performance achieved" (Makino et al., 2004, p.1034).

Following the above results, we are not able to fully accept or reject H1b once we cannot ascertain that, if we use different measures of performance, subsidiaries located in larger countries would perform better than subsidiaries located in smaller countries.

Overall, we can confirm that (H1) subsidiaries located in large countries perform, on average better than subsidiaries located in small countries. We can infer that because 3 out of the 4 performance measures used confirm this hypothesis.

When looking at the characteristics of the subsidiaries, like their experience and their size, we can see that the subsidiaries located in larger countries tend to have more experience,

which goes in line with the literature that states older subsidiaries can easily help to create and transfer the knowledge obtained in the host country helping the subsidiary develop their firm specific advantages (Ma et al., 2006). Regarding size, we get the conclusion that the larger firms correspond to the group of larger countries which also follows the literature we have seen in chapter 2.2.1 where Huang and Huang (2014) stated that normally larger countries have larger firms.

The summary of the above conclusions are presented in Table 9.

**Table 9** - Summary of results

| Hypotheses | Confirmed | Not confirmed |
|---|---|---|
| **H1:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries. | ✓ | |
| **H1a:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries regardless of the performance measures. | ✓ | |
| **H1b:** Subsidiaries located in larger host countries have, on average, better performance than subsidiaries located in small countries regardless of the country size measures. | | ✓ |

**Source**: Own elaboration

# 5. Conclusions, Policy Implications and Future Research

The main purpose of this dissertation was to test whether there were performance differences between subsidiaries located in two types of countries (small and large) and if those differences, if any, would differ for different measures of country size and of performance. There can be found on literature many studies that focused on subsidiary performance, but very few include the role of country size on this matter. Also, at the best of our knowledge, there´s not any other study that deals with the comparison of subsidiary performance differences between two groups of country size.

Based on a sample of 16,497 firms from 26 countries for the period of 5 years and resorting to the Mann Whitney test, we conclude that, overall and in terms of ROE and ROS, subsidiaries located in larger countries perform, on average better than subsidiaries located in small countries, regardless of the country size measure (population, GDP or GDP per capita). Also, for Assets Growth, the above result applies when country size is measured by Population and GDP. Only for ROA, the results do not follow the literature, however it was recognized in previous literature that the performance measured by ROA might not reflect the correct performance success of the subsidiary (Makino et al., 2004). This means that overall, it is positive for subsidiaries to be located in larger countries. This conclusion follows the results we found in the literature (eg. Christmann et al., 1999; Dadzie el al., 2014 and Wu and Salomon, 2014; Brouthers, 2002 and Beugelsdijk et al., 2015).

As we said before, becoming a MNE is not an easy process. The mentioned results have general implications, especially for managers of MNEs. It is recognized by Bhatti et al. (2015) that choosing the country market with the right conditions to operate and make investments will lead to competitive advantages. The results suggest that larger countries provide subsidiaries better conditions to increase its performance. When managers decide to start operating abroad and they have to decide in which country to establish their subsidiaries they might have better performance results if they chose larger countries as observed in Makino et al. (2008).

Our study has some limitations. First, our dissertation focuses only on European Countries. This happened because we did not have other countries available in AMADEUS

database. As we stated before, the larger countries in Europe could be consider only as medium or even small if we take the global economy into consideration. For this reason a further research could be made in this line, using other variety of countries for analysis.

Another limitation is regarding the fact we have only shown if there were significant performance differences in foreign subsidiaries across two groups of countries and we did not explore why there are these variations. A further research can be made from this using a cross country analysis in order to extend this line of study. We have not done it due to the lack of important variables available in our database or other key country specific factors. Second, it would also be beneficiary to include the home country of each subsidiary in the analysis once there are studies (e.g. Makino el al., (2008)) that suggest the home country can influence foreign affiliate's strategies in host country. Finally a future research might include a different time frame from the one we have used. We have used 5 years of analysis because it was the one that provided the most balanced data, however it gathers a period of Economic crisis in Europe so it would be positive to have done it using a different time period.

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# Appendix

**Table A1** - Shapiro-Wilk test for normal data

| Variable | Obs | W | V | z | Prob>z |
|---|---|---|---|---|---|
| ROE | 73999 | 0.47136 | 13000 | 26.448 | 0.00000 |
| ROA | 78778 | 0.86647 | 3448.888 | 22.754 | 0.00000 |
| ROS | 61957 | 0.1677 | 18000 | 27.279 | 0.00000 |
| Growth | 62512 | 0.67846 | 7020.72 | 24.654 | 0.00000 |
| Size_Empl | 77541 | 0.14702 | 22000 | 27.896 | 0.00000 |
| Experience | 82455 | 0.80577 | 5182.47 | 23.907 | 0.00000 |
| Population | 82485 | 0.87556 | 3321.22 | 22.664 | 0.00000 |
| GDP | 82485 | 0.98254 | 465.913 | 17.174 | 0.00000 |
| GDP_percapita | 82485 | 0.84085 | 4247.394 | 23.351 | 0.00000 |